WHAT IS CLAIMED IS:

1. A device, comprising:

an anode;

a cathode;

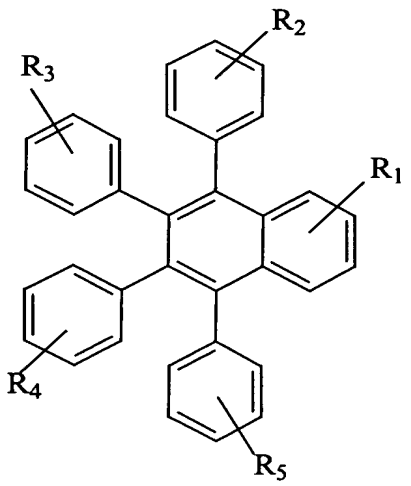
a first organic layer disposed between the anode and the cathode, wherein the first organic layer comprises a material that produces phosphorescent emission when a voltage is applied between the anode and the cathode; and

a second organic layer disposed between the first organic layer and the cathode, wherein the second organic layer is in direct contact with the first organic layer, and wherein the second organic layer comprises an aromatic non-heterocyclic hydrocarbon material.

2. The device of claim 1, wherein the aromatic hydrocarbon material has a molecular dipole moment of less than about 2.0 debyes.

3. The device of claim 2, wherein the aromatic hydrocarbon material has a molecular dipole moment of zero.

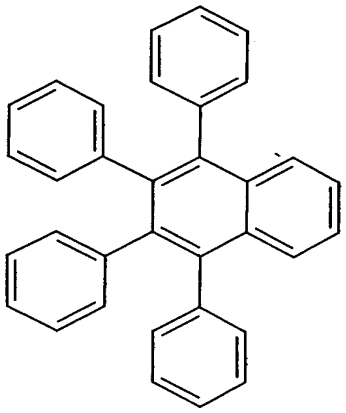
4. The device of claim 1, wherein the aromatic hydrocarbon material comprises a material having the structure:



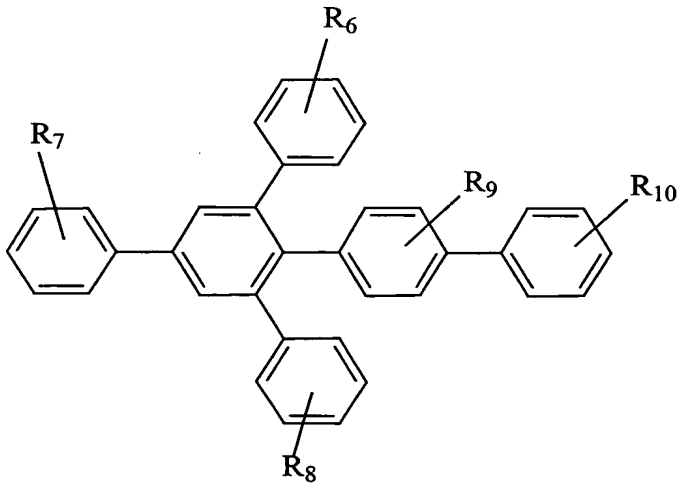
wherein:

R_1-R_5 each represent no substitution, mono-, di-, or tri- substitution, and wherein the substituents are the same or different, and each is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroalkyl and substituted aryl.

5. The device of claim 4, wherein the aromatic hydrocarbon material has the structure:



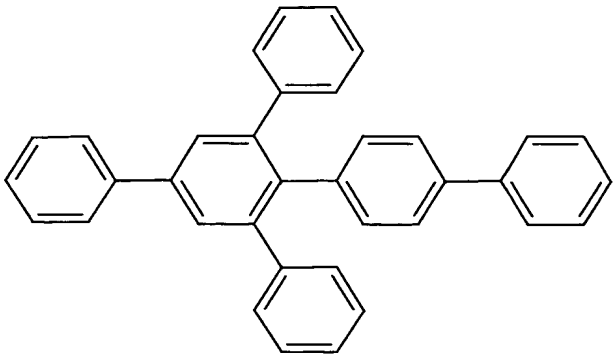
6. The device of claim 1, wherein the aromatic hydrocarbon material has the structure:



wherein:

R_6-R_{10} each represent no substitution, mono-, di-, or tri- substitution, and wherein the substituents are the same or different, and each is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroalkyl, and substituted aryl.

7. The device of claim 6, wherein the aromatic comprises a hydrocarbon material having the structure:



8. The device of claim 1, wherein the second organic layer is in direct contact with the cathode.

9. The device of claim 1, further comprising a third organic layer disposed between the second organic layer and the cathode.

10. The device of claim 1, wherein the aromatic hydrocarbon material has a highest occupied molecular orbital that is not more than 0.81 eV less than the highest occupied molecular orbital of the hole transporting material in the first organic layer.

11. The device of claim 10, wherein the aromatic hydrocarbon material has a molecular dipole moment less than about 2.0 debyes.

12. A device, comprising:

an anode;

a cathode;

an first organic layer disposed between the anode and the cathode, wherein the first organic layer comprises a material that produces phosphorescent emission when a voltage is applied between the anode and the cathode;

a second organic layer disposed between the first organic layer and the cathode, wherein

the second organic layer is in direct contact with the first organic layer, and wherein the second organic layer comprises an aromatic non-heterocyclic hydrocarbon material having a highest occupied molecular orbital that is at least 0.81 eV less than the highest occupied molecular orbital of the hole transporting material in the first organic layer.

13. The device of claim 12, wherein the aromatic hydrocarbon material has a molecular dipole moment less than about 2.0 debyes.

14. A device, comprising:

an anode;

a cathode;

an first organic layer disposed between the anode and the cathode, wherein the first organic layer is comprises a material that produces phosphorescent emission when a voltage is applied between the anode and the cathode;

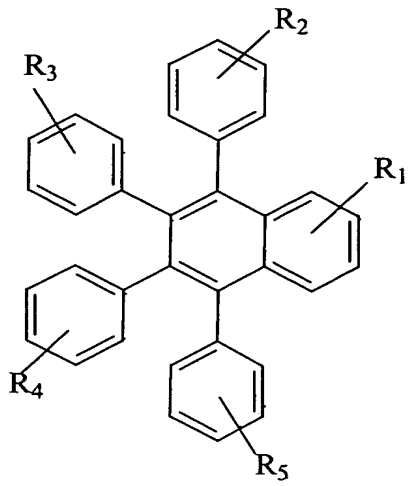
a second organic layer disposed between the first organic layer and the cathode, wherein the second organic layer is in direct contact with the first organic layer, and wherein the second organic layer comprises an aromatic non-heterocyclic hydrocarbon material, and wherein the device has an unmodified external quantum efficiency of at least about 3% and a lifetime of at least about 1000 hours at an initial luminance of about 100 to about 1000 cd/m^2.

15. The device of claim 14, wherein the device has an unmodified external quantum efficiency of at least about 5% and a lifetime of at least about 1000 hours at an initial luminance of about 100 to about 1000 cd/m^2.

16. The device of claim 14, wherein the aromatic hydrocarbon material has a molecular dipole moment less than about 2.0 debyes.

17. The device of claim 14, wherein the aromatic hydrocarbon material has a zero molecular dipole moment.

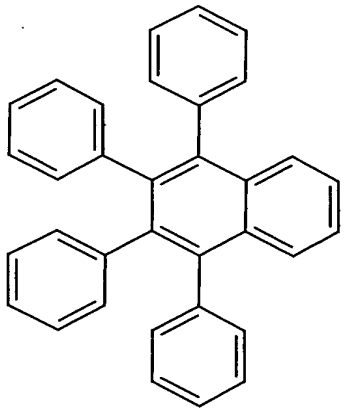
18. The device of claim 14, wherein the aromatic hydrocarbon material has the structure:



wherein:

R_1-R_5 each represent no substitution, mono-, di-, or tri- substitution, and wherein the substituents are the same or different, and each is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroalkyl, and substituted aryl.

19. The device of claim 18, wherein the aromatic hydrocarbon material has the structure:

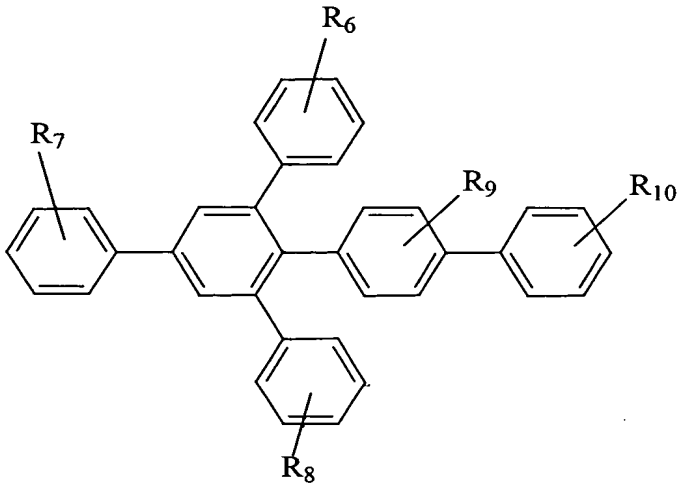


20. The device of claim 14, wherein after 100 hours of operation at an initial luminance of

600 cd/m^2 at least about 90% of initial luminance is retained.

21. The device of claim 14, wherein after 1000 hours of operation at an initial luminance of 1000 cd/m^2 at least about 70% of initial luminance is retained.

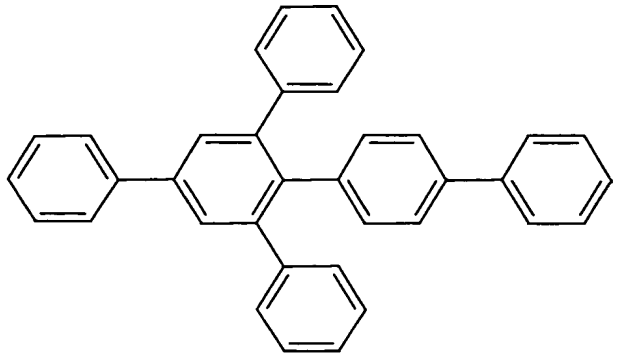
22. The device of claim 14, wherein the aromatic hydrocarbon material has the structure:



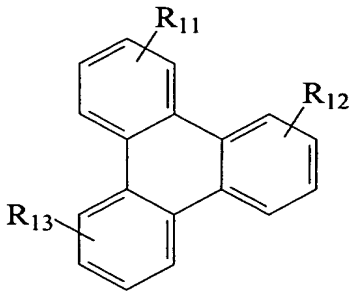
wherein:

R_6-R_{10} each represent no substitution, mono-, di-, or tri- substitution, and wherein the substituents are the same or different, and each is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroalkyl, and substituted aryl.

23. The device of claim 22, wherein the aromatic hydrocarbon material has the structure:



24. The device of claim 1, wherein the aromatic hydrocarbon material has the structure:

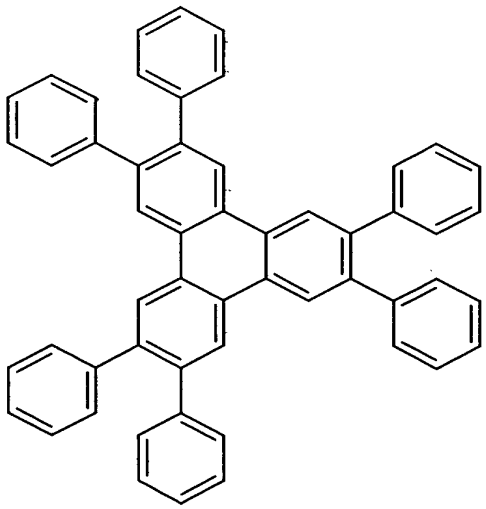


wherein:

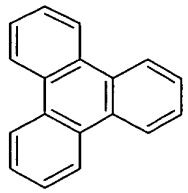
R_{11}-R_{13} each represents no substitution, mono-, di-, or tri- substitution, and wherein the substituents are the same or different, and each is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroalkyl, and substituted aryl.

25. The device of claim 24, wherein R_{11}, R_{12}, and R_{13} are each phenyl.

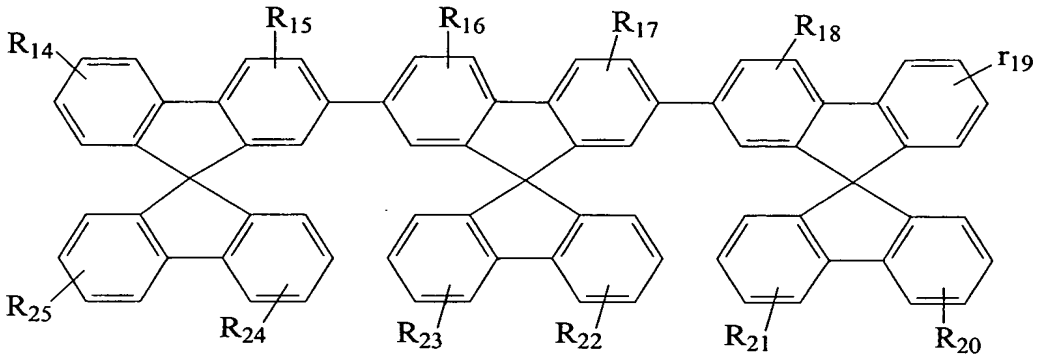
26. The device of claim 25, wherein the aromatic hydrocarbon material has the structure:



27. The device of claim 24, wherein the aromatic hydrocarbon material has the structure



28. The device of claim 1, wherein the aromatic hydrocarbon material has the structure:



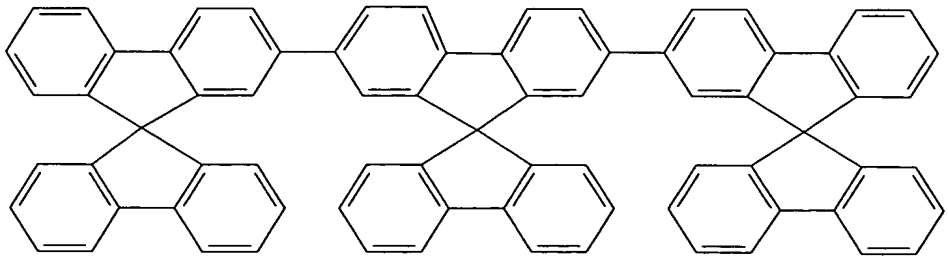
wherein:

R_{14}, R_{19}, and R_{20}-R_{25} each represents no substitution, mono-, di-, or tri- or tetra- substitution, and

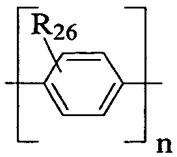
R_{15}-R_{18} each represent no substitution, mono-, di-, tri- substitution, and

each R substituent is the same or different, and each is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroalkyl and substituted aryl.

29. The device of claim 28, wherein the aromatic hydrocarbon material has the structure



30. The device of claim 1, wherein the aromatic hydrocarbon material has the structure:

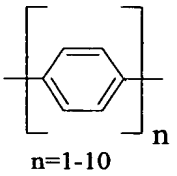


wherein

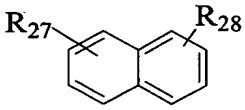
R_{26} represents no substitution, mono-, di-, tri-, or tetra substitution, and wherein each R is the same or different substituent, and each is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroalkyl and substituted aryl, and

each R may be linked together to form cyclic substituents such as cycloalkyl or aromatic non-heterocyclic rings.

31. The device of claim 30, wherein the aromatic hydrocarbon material has the structure



32. The device of claim 1, wherein the aromatic hydrocarbon material has the structure

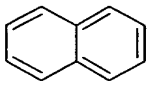


wherein

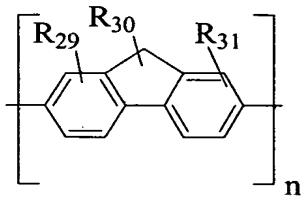
R_{27} and R_{28} each represents no substitution, mono-, di-, tri-, or tetra substitution, and wherein R_{27} and R_{28} are the same or different substituents, and each is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroalkyl and substituted aryl, and

each R may be linked together to form cyclic substituents such as cycloalkyl or aromatic non-heterocyclic rings.

33. The device of claim 32, wherein the aromatic hydrocarbon material has the structure



34. The device of claim 1, wherein the aromatic hydrocarbon material has the structure



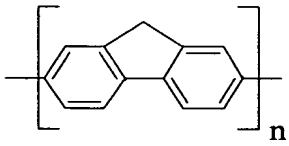
n=1-10

wherein

R_{29}-R_{31} each represents no substitution, mono-, di-, or tri- substitution, and wherein R_{29}-R_{31} are the same or different substituents, and each is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroalkyl and substituted aryl, and

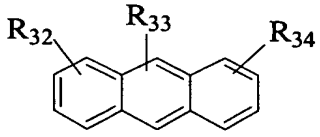
each R may be linked together to form cyclic substituents such as cycloalkyl or aromatic non-heterocyclic rings.

35. The device of claim 34, wherein the aromatic hydrocarbon material has the structure



n=1-10

36. The device of claim 1, wherein the aromatic hydrocarbon material has the structure



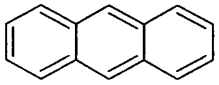
wherein

R_{32}-R_{34} each represents no substitution, mono-, di-, or tri- substitution, and wherein R_{32}-R_{34} are the same or different substituents, and each is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroalkyl and substituted aryl, and

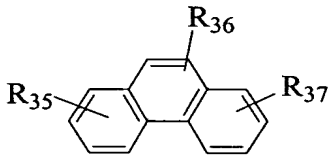
each R may be linked together to form cyclic substituents such as cycloalkyl or aromatic non-

heterocyclic rings.

37. The device of claim 36, wherein the aromatic hydrocarbon material has the structure



38. The device of claim 1, wherein the aromatic hydrocarbon material has the structure

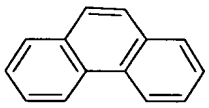


wherein

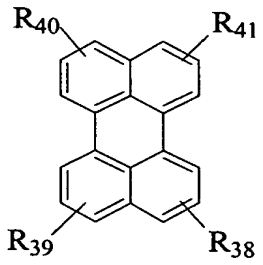
R_{35}-R_{37} each represents no substitution, mono-, di-, or tri- substitution, and wherein R_{35}-R_{37} are the same or different substituents, and each is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroalkyl and substituted aryl, and

each R may be linked together to form cyclic substituents such as cycloalkyl or aromatic non-heterocyclic rings.

39. The device of claim 38, wherein the aromatic hydrocarbon material has the structure



40. The device of claim 1, wherein the aromatic hydrocarbon material has the structure

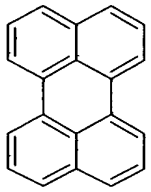


wherein

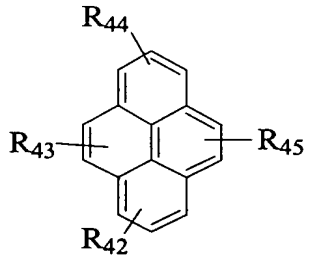
R_{38}-R_{41} each represents no substitution, mono-, di-, or tri- substitution, and wherein R_{38}-R_{41} are the same or different substituents, and each is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroalkyl and substituted aryl, and

each R may be linked together to form cyclic substituents such as cycloalkyl or aromatic non-heterocyclic rings.

41. The device of claim 40, wherein the aromatic hydrocarbon material has the structure



42. The device of claim 1, wherein the aromatic hydrocarbon material has the structure

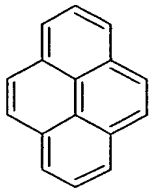


wherein

R_{42}-R_{45} each represents no substitution, mono-, di-, or tri- substitution, and wherein R_{42}-R_{45} are the same or different substituents, and each is selected from the group consisting of alkyl, alkenyl, alkynyl, aryl, heteroalkyl and substituted aryl, and

each R may be linked together to form cyclic substituents such as cycloalkyl or aromatic non-heterocyclic rings.

43. The device of claim 42, wherein the aromatic hydrocarbon material has the structure



44. The device of claim 1, wherein the second organic layer is in direct contact with the cathode.

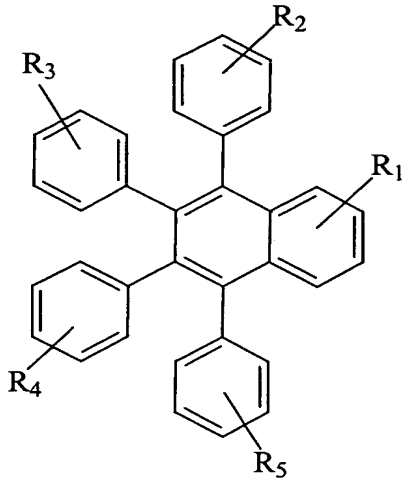
45. A device, comprising:

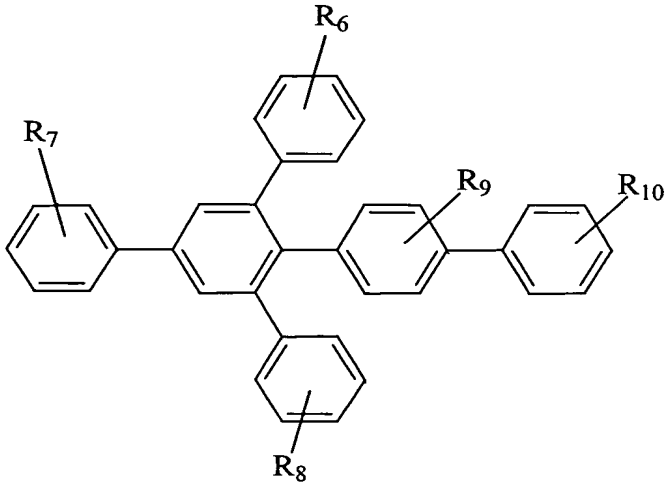
an anode;

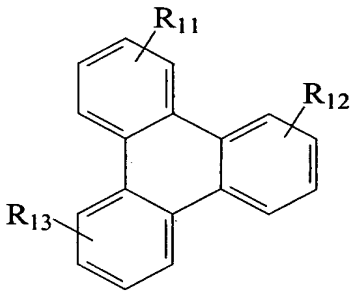
a cathode;

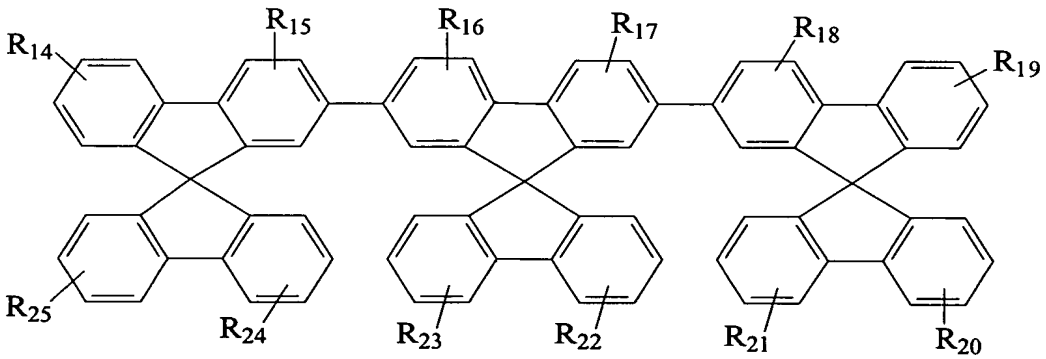
a first organic layer disposed between the anode and the cathode, wherein the first organic layer comprises a material that produces phosphorescent emission when a voltage is applied between the anode and the cathode; and

a second organic layer disposed between the first organic layer and the cathode, wherein the second organic layer is in direct contact with the first organic layer, and wherein the second organic layer comprises aromatic material selected from the group consisting of:









wherein :

R_1-R_{10} each represent no substitution, mono-, di-, or tri- substitution, R_{11}-R_{13}, R_{15}-R_{18}, each represents no substitution, mono-, di-, or tri- substitution, and R_{14}, R_{19}, and R_{20}-R_{25} each represents no substitution, mono-, di-, or tri- or tetra- substitution, and

and wherein R_1-R_{25} are the same or different substituents, and each is selected from the group

consisting of alkyl, alkenyl, aryl, heteroalkyl, substituted aryl, substituted heteroaryl and heterocyclic groups.

46. The device of claim 45, wherein the aromatic material has a molecular dipole moment of less than about 2.0 debyes.

47. The device of claim 46, wherein the aromatic material has a molecular dipole moment of zero.

48. The device of claim 45, wherein the aromatic material includes only C and H atoms.

49. A device, comprising:

an anode;

a cathode;

a first organic layer disposed between the anode and the cathode, wherein the first organic layer comprises a material that produces phosphorescent emission when a voltage is applied between the anode and the cathode; and

a second organic layer disposed between the first organic layer and the cathode, wherein the second organic layer is in direct contact with the first organic layer, and wherein the second organic layer comprises an aromatic material wherein the aromatic material includes a core comprising at least 3 phenyl rings, wherein each phenyl ring in the core is connected to every other phenyl ring in the core either directly, or by a chain of phenyl rings that are either fused or attached by a single C-C bond.

50. The device of claim 49, wherein the aromatic material includes a core comprising at least 6 phenyl rings.